VOLUME 54 1990 NUMBER 1

CONTENTS

A. A. MELIKYAN: The problem of time-optimal control with search for a target point 1
V. A. BAIDOSOV: Fuzzy differential inclusions 8
D. B. LEBEDEV: Control of the motion of a solid rotating about its centre of mass 13
A. S. KEL'ZON and A. A. KOVAL: Stability of a horizontal rotor in flexible rolling bearings with clearances 19
V. P. ZHITNIKOV: Flow of a plane jet of liquid from a reservoir with flexible walls near a screen 25
L. D. AKULENKO, S. A. MIKHAILOV and S. V. NESTEROV: The oscillations of an oscillator near the interface between two liquids 30
S. Ya. SEKERZH-ZEN'KOVICH: The free oscillations of a viscous two-layer fluid in a closed vessel 39
O. Yu. DINARIYEV: The velocity of propagation of a signal in a fluid with relaxation 46
A. G. NIKOLAYEV and V. S. PROTSENKO: First and second fundamental axisymmetric problems of elasticity theory for doubly-connected domains bounded by the surfaces of a sphere and a spheroid 51
A. A. FONAREV: On seeking buckling modes of a circular plate 60
V. M. ALEKSANDROV and D. A. POZHARSKII: Some mixed problems of the theory of bending of plates on an elastic foundation 64
V. N. PAIMUSHIN: A version of a refined non-linear theory of thin elastic sandwich shells of iteration type 69
L. Kh. TALYBLY: Deformation of a viscoelastic cylinder fastened to a housing under non-isothermal dynamic loading 74
I. P. GETMAN and Yu. A. USTINOV: Wave propagation in an elastic longitudinally inhomogeneous cylinder 83
O. Yu. ZHARII: The eigenfunction expansion method in dynamic electroelasticity problems 88
A. M. LIN'KOV and S. G. MOGILEVSKAYA: Hypersingular integrals in plane problems of the theory of elasticity 93
V. V. SIL'VESTROV: On the stress–strain state near a three-dimensional crack in a two-sheeted surface 99
S. A. NAZAROV and O. R. POLYAKOVA: Stress intensity factors for parallel cracks lying close together in a plane region 107
I. I. BLEKHMAN and O. Z. MALAKHOVA: Extremal criteria of the stability of certain motions 115
E. L. AMROMIN, M. A. BASIN and V. A. BUSHKOVSKII: Two solutions of the three-dimensional problem of limit waves on the surface of a ponderable fluid 134
V. I. TARAKANOV: Lower estimates of the characteristic frequencies of the oscillations of a liquid with a free surface in channels of arbitrary cross-section 137
M. A. RVACHEV: On statically possible fields in a simply connected volume 143

VOLUME 54 1990 NUMBER 2

CONTENTS

L. I. SEDOV: Some remarks on the relativistic concepts of velocities and accelerations 147
V. A. VLADIMIROV and V. V. RUMYANTSEV: Inversion of Lagrange's theorem for a rigid body with a cavity containing a viscous liquid 154
M. L. PIVOVAROV and F. L. CHERNOUS'KO: Oscillations of a rigid body with a toroidal cavity filled with a viscous liquid 164
A. P. MARKEYEV: Resonances and asymptotic trajectories in Hamiltonian systems 169
N. K. MOSHCHUK and I. N. SINITSYN: On stochastic non-holonomic systems 174
D. D. LESHCHENKO and S. N. SALLAM: Perturbed rotational motions of a rigid body similar to regular precession 183
V. A. BUZHINSKII: Vortex drag of a plate during vibrations in a slightly viscous fluid 191
A. S. BASMAT and A. N. GUZ: Interaction of an unsteady-state wave with a rigid sphere immersed in a compressible viscous fluid 196
A. I. RYLOV: On the impossibility of regular reflection of a steady-state shock wave from the axis of symmetry 200
V. I. KERCHMAN: Problems in the spreading and extrusion of a layer of non-linearly viscous fluid 204
A. V. CHIGAREV: The method of averaging in dynamic problems of the theory of the elasticity of structurally inhomogeneous media 211
A. G. GORSHKOV, Yu. V. RACHINSKII and D. V. TARLAKOVSKII: Non-steady waves in an acoustic medium with boundaries shaped like a parabolic cylinder 219
L. V. PETUKHOV and K. E. SOKOV: Inhomogeneous elastic structures optimal in stiffness 226
N. V. MOVCHAN and S. A. NAZAROV: On the state of stress and strain near cone apices 231
A. N. BORODACHEV: On a class of exact solutions of a non-axisymmetric contact problem for an inhomogeneous elastic half-space 242
B. M. NULLER: Contact problems for systems of elastic half-planes 249
M. A. SUMBATYAN: The plane contact problem for an elastic layer for high vibration frequencies 253
I. V. ANDRONOV: Scattering of a bending wave by a finite rectilinear crack in an elastic plate 258
A. L. KALAMKAROV, B. A. KUDRIAVTSEV and V. Z. PARTON: The boundary-layer method in the fracture mechanics of composites of periodic structure 266
L. D. PUSTYL'NIKOV: On certain final motions in the *n*-body problem 272
S. N. KIRPICHNIKOV and A. G. STEPANOV: The possibility of structurally stable global oscillators occurring when dissipative forces are introduced into dynamic systems asymptotically stable in the large 275
P. N. SVIRKUNOV and E. A. FEL'DE: The selfsimilar asymptotic form of non-stationary vortex flows 278
V. A. AVAKYAN and L. P. SMIRNOV: A generalized Faxen formula for various forms of boundary conditions 281
E. N. BERESLAVSKII: The construction of the constant-velocity contour of a foundation of a hydraulic installation in the case of the filtration of two liquids of different density 285
N. A. GLAZUNOVA and Yu. A. STEPANYANTS: Estimates of the parameters of increasing perturbations in shear flows of an inhomogeneous magnetized plasma 289

VOLUME 54 1990 NUMBER 3

CONTENTS

YU. S. KORBICH, V. I. MAKSIMOV and YU. S. OSIPOV: Dynamic simulation of controls in certain parabolic systems 293
S. P. OKHEZIN: An approximation in the problem of controlling the shape of the region for a parabolic system 298
A. G. AZIZOV: Motion of controllable mechanical systems with servo-constraints 302
V. L. KAN and A. S. KEL'ZON: Stability and controllability in proportional navigation 309
I. YU. KRIVONOS, V. G. POKOTILO and B. N. PSHENICHNYI: Optimization of the observation process 317
A. F. KLEIMENOV: Cooperative solutions in a many-person positional differential game with continuous payment functions 321
M. A. ZARKH: A universal second-player strategy in a linear differential game 326
M. D. LOKSHIN: Differential games with integral constraints on disturbances 331
O. V. KAPTSOV: New solutions of two-dimensional stationary Euler equations 337
B. YU. SKOBELEV: An invariant finite-dimensional approximation to the Navier–Stokes equations and self-excited oscillatory modes of Poiseuille flow 343
A. B. AIRAPETOV: Motion of an initially point vortex in a flow of viscous fluid 355
S. A. VELICHKO and YU. B. LIFSHITZ: Computation of attached flow past an airfoil profile at high Reynolds numbers 359
I. V. ANDRONOV and B. P. BELINSKII: On acoustic boundary-contact problems for a vertically stratified medium bounded from above by a plate with concentrated inhomogeneities 366
N. A. KUDRYASHOV: Exact solutions of the non-linear wave equations arising in mechanics 372
I. M. BERMUS and L. S. SRUBSHCHIK: Non-axisymmetric buckling of shallow spherical shells 375
E. V. KOVALENKO: On the analysis of thin porous coatings 388
E. V. GLUSHKOV and N. V. GLUSHKOVA: Determination of the dynamic contact stiffness of an elastic layer 393
S. Z. DUNIN and G. A. MAKSIMOV: Pulse propagation in media with small velocity dispersion and relaxation time spectrum of the form $1/\tau$. Exact solution 397
A. G. BYKOVTSEV: On the plastic loading process behind an unloading shock front 402
S. V. BOLOTIN: Motions doubly asymptotic to invariant tori in the theory of perturbed Hamiltonian systems 412
V. B. KOLMANOVSKII and A. K. SPIVAK: Control of the speed of response of predator–prey systems 417
I. N. KANDOBA: On a method of solving a shape optimization problem in elasticity theory 421

VOLUME 54 1990 NUMBER 4

CONTENTS

G. A. LEONOV: The orbital stability of the trajectories of dynamic systems 425
LE SUAN AN: The Painlevé paradoxes and the law of motion of mechanical systems with Coulomb friction 430
A. S. KOVALEVA: Separation of motions in non-linear oscillatory systems with random perturbations 438
L. E. KAPLAN: The selfconsistent problem of the vibrations of an infinite string loaded with a moving point mass 444
N. I. YAVORSKII: Asymptotic laminar wakes 449
N. G. KUZNETSOV: A variational method of determining the eigenfrequencies of a liquid in a channel..... 458
V. N. LIKHACHEV: Diffraction of a short acoustic wave by a smooth body with a discontinuity in the radius of curvature of its surface..... 465
A. M. ELIZAROV and E. V. FEDOROV: Airfoil optimization by the method of inverse boundary-value problems 473
A. V. LATYSHEV: The use of Case's method to solve the linearized BGK equations for the temperature-jump problem 480
A. M. TER-KRIKOROV: Stratified flows and dipole approximations 485
A. A. NEPOMNYASHCHII and I. B. SIMANOVSKII: Long-wave thermocapillary convection in layers with deformable interfaces 490
G. A. DOMBROVSKII: Integration of the equations of plane stationary non-linear filtration 497
V. A. GRISHIN, G. YA. POPOV and V. V. REUT: Analysis of box-like shells of rectangular cross-section 501
R. A. DUDNIK, E. A. MAKEYEVA and E. A. FIYAKSEL: On the influence of inhomogeneities on the vibrations of a cylindrical shell 508
S. P. BORSHCH, A. L. POPOV and G. N. CHERNYSHEV: Method of extracting singularities in the problem of the hydroelastic vibrations of a shell excited by concentrated forces..... 512
N. N. ROGACHEVA: Refined membrane theory of electroelastic shells 518
E. L. NAKHMEIN and B. M. NULLER: Dynamic contact problems for an orthotropic elastic half-plane and a composite plane 523
L. M. FLITMAN: Separation-free flow around a blunt body by a high-velocity elastic–plastic flow 531
E. A. DEVYATKIN and I. V. SIMONOV: The theory of the fracture of a superconductor in a magnetic field..... 538
LE KHAN CHAU: Variational principles of non-linear theory of brittle fracture 543
YU. N. GORDEYEV: The selfsimilar dynamic problem of a hydraulic crack when its sides interact with a cleaving gas flow 549
A. L. NI and V. E. FORTOV: The equations of motion of condensed media with continually kinetic fracture.... 554
B. N. SOKOLOV: Bounds on control in the linear dynamic optimization problem with a quadratic functional 559
A. G. BERSHADSKII: A special case of hydrodynamic stability..... 562
A. V. KISTOVICH and YU. D. CHASHECHKIN: The formation of zero frequency internal waves during free convection in a temperature-stratified liquid..... 565
A. A. LOKSHIN and E. A. SAGOMONYAN: The propagation of a weak discontinuity in a non-linear medium with rigid unloading 569
YU. I. KADASHEVICH and A. B. MOSOLOV: The relationship between the endochronic theory of plasticity and the "new" measure of internal time 571
V. V. KOBELEV: Fragmentation of a composite material and fragmentation of fibres under a dynamic load 577

VOLUME 54 1990 NUMBER 5

CONTENTS

V. V. SAZONOV: The dependence of the solutions of the equations of motion of mechanical systems on a large parameter ... 583
L. D. AKULENKO: Equivalent linearization of quasilinear oscillating systems with slowly varying parameters ... 589
V. I. VOROTNIKOV: Optimal stabilization of motion with respect to some of the variables ... 597
B. E. FEDUNOV: Maximally fast braking of an object in controlled motion, under the action of aerodynamic drag and gravity ... 605
A. G. IVANOV: The controllability of a non-linear system in a class of generalized controls ... 612
A. V. KIM, A. I. KOROTKII and YU. S. OSIPOV: Inverse problems in the dynamics of parabolic systems ... 619
A. G. PASHKOV: Estimate of the guaranteed value in a non-linear differential game of approach ... 624
I. V. DEREVICH and L. I. ZAICHIK: An equation for the probability density, velocity, and temperature of particles in a turbulent flow modelled by a random Gaussian field ... 631
S. V. MELESHKO: Triple-wave potential flows of a polytropic gas ... 637
N. A. BRITOV: Stokes approximation for two-dimensional inductionless magnetohydrodynamic flows ... 641
N. N. BOBKOV and YU. P. GUPALO: A model of a non-homogeneous pseudofluidized layer with particle exchange between the non-homogeneity and the layer ... 646
G. A. MORAR and G. YA. POPOV: Construction of discontinuous solutions in three-dimensional elasticity theory ... 656
A. G. KULIKOVSKII and L. A. PEKUROVSKAYA: Longitudinal waves in an elastic medium with a piecewise-linear dependence of the stress on the strain ... 663
G. L. BROVKO: Material and spatial representations of the constitutive relations of deformable media ... 668
V. M. ALEKSANDROV and B. I. SMETANIN: Supersonic cleavage of an elastic strip ... 677
L. A. AGALOVYAN, M. G. ASRATYAN and R. S. GEVORKYAN: The asymptotic solution of problems of the action of a concentrated force and a piecewise-continuous load on a two-layered strip ... 683
E. V. KOVALENKO, D. G. TARASOV and M. I. CHEBAKOV: Exact solution of the antiplane contact problem for finite canonical domains ... 688
A. V. MANZHIROV: The torsion of a growing cylinder by a rigid stamp ... 692
V. A. MISYURA: An inequality in the theory of a semilinear elastic body ... 699
V. V. KOZLOV and A. I. NEISHTADT: On the realization of holonomic constraints ... 705
V. A. ATANASOV: The asymptotic stabilizability of positions of relative equilibrium of a satellite-gyrostat ... 708
V. N. SOKOLOV: The minimum dimensions of the control vector in the linear dynamic problem of stabilization ... 711
E. N. BERESLAVSKII: The intake of purified fresh water with filtration from a reservoir ... 714
S. M. AIZIKOVICH: An asymptotic solution of a class of coupled equations ... 719
A. A. BARMIN and M. V. SHCHELKACHEV: The analysis of the stability of shock waves ... 725

VOLUME 54 1990 NUMBER 6

CONTENTS

F. L. CHERNOUS'KO: Decomposition and suboptimal control in dynamical systems 727
A. A. BELOUSOV and A. A. CHIKRII: Complete conflict controllability of quasilinear processes 735
A. A. BUROV and A. V. KARAPETYAN: The existence and stability of invariant sets of dynamical systems 744
V. I. OREKHOV: Steady motions and integral manifolds of systems with quadratic integrals 751
V. A. SINITSYN: The principle of least constraint for systems with non-restoring constraints 756
L. M. MARKHASHOV: The motion of a material point in Friedmann–Lobachevsky space 761
D. ZEKOVIĆ: The brachistochrone motion of a mechanical system with non-holonomic, non-linear and non-stationary constraints 765
S. D. FURTA: The dynamic stability of an elastic column 769
A. A. ZEVIN and L. A. FILONENKO: Forced oscillations of a non-linear system with a repulsive positional force 776
V. V. SAZONOV and V. V. SIDORENKO: The perturbed motions of a solid close to regular Lagrangian precessions 781
S. A. BELIKOV: The local boundedness of the perturbed motions of a gyroscope in gimbals with dissipative and accelerating forces 787
D. V. LEBEDEV: Stabilization of the motion of a dynamic system under conditions of uncertainty 794
V. F. SANNIKOV: Exact solutions of the linear problem of the steady-state waves created by a dipole in a flow of a stratified fluid 799
P. A. AVDEYEV: On the stability of the stationary front of an exothermic reaction in a condensed phase 804
YU. G. GUBAREV: On the converse Lagrange theorem in magnetohydrodynamics 812
YU. M. MAMEDOV: The construction of reciprocity and integral representation formulas of the general solution for quasistatic and dynamic problems of uncoupled generalized thermoelasticity 815
V. A. YURKO: A problem in elasticity theory 820
YU. A. ROSSIKHIN and M. V. SHITIKOVA: Non-linear free spatial vibrations of combined suspension systems 825
I. V. PANFEROV: Stresses in elastic conical tubes of transversely isotropic materials with spherical anisotropies under temperature and force loadings 832
G. N. MIRENKOVA and E. G. SOSNINA: A hollow ellipsoidal needle in an orthotropic elastic medium 837
A. N. BORODACHEV: A method of constructing weighting functions for a circular crack 841
V. S. ANTSIFEROV and YU. P. ZHELTOV: On the deformation of an elastic half-space with a thin slit for mixed conditions on its boundary 848
A. M. TKACHEV: A geometrical method of solving the problem of maximizing the norm of the state vector of the system in a finite control interval 852
A. E. PURO: On the construction of general solutions of the theory of the elasticity of inhomogeneous solids 855
Author/Title Alphabetical index I

ISSN 0021-8928

Printed in Great Britain by Nuffield Press Ltd